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[54] **SURFACE MODIFICATION OF SYNTHETIC DIAMOND FOR PRODUCING ADHERENT THICK AND THIN FILM METALLIZATIONS FOR ELECTRONIC PACKAGING**

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[52] **U.S. Cl.** **428/408**; 428/457; 428/469; 428/472; 428/698; 428/701; 428/702; 204/192.38; 427/534; 427/542; 427/96; 427/99; 427/249; 427/309; 427/314; 427/350; 427/372.2; 427/380; 427/419.2

[58] **Field of Search** 428/408, 457, 428/469, 472, 698, 701, 702; 204/192.38; 427/534, 542, 96, 99, 249, 309, 314, 350, 372.2, 380, 419.2

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[57] **ABSTRACT**

An article and a method of making surface modified synthetic diamond substrates at temperatures below 500° C. for electronic packaging applications are described. The article consists of a synthetic diamond substrate, the surface of which has been modified by providing an adherent thin coating of a ceramic (alumina) material so as to enable metallization of synthetic diamond by current industrial methods. The method of surface modification comprises deposition of a thin transition metal layer on the synthetic diamond substrate prior to low temperature reactive vapor deposition of aluminum followed by annealing in an oxygen atmosphere.

2 Claims, 8 Drawing Sheets